GrummanWorld

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X-29 Hits Mach 1; Sister Ship Prepares For Flight Line

On December 13, the Grumman X-29 broke the sound barrier for the first time. The same week, the U.S. Air Force broke the news that the X-29's sister ship has been given the okay to get ready for the flight line.

The Air Force is funding X-29 No. 2 for high-angle-of-attack flight tests and is adding another two years to the first X-29's flight test program. Grumman and the Air Force are currently negotiating the final agreement.

The funding of the second X-29 marks the first time in a dozen years or more that the Air Force has invested money in an experimental aircraft program. Grumman has already invested over $50 million in the X-29 program and plans to invest another $1.5 million this year.

"Grumman will add a spin chute and necessary instrumentation to the second aircraft for a 'high alpha' program," says Bob Roemer, X-29 program director.

High alpha – high-angle-of-attack – maneuvers are risky. The test pilot puts the craft through fast, tight twists and turns. These turns push the plane's controllability to the limit, a limit beyond that of today's aircraft. Such a program will uncover the capabilities of the X-29 advanced technology demonstrator and its flight control system. The spin chute will help the pilot get control back if the X-29 goes into a spin.

The Air Force funding will almost double the current 42-member X-29 team, which is now split evenly between Long Island and the NASA's Ames-Dryden Flight Research Center in Edwards Air Force Base, California.

"We'll continue to fly No. 1 while the design and production work are going on. We expect to have the second aircraft on flight status in 1987," Roemer states. Flight test programs with both aircraft will run into 1989.

In the current program, it was more a case of NASA project pilot Steve Ishmael sliding the X-29 through the sound barrier rather than breaking it. "It was very calm and quiet," says Roemer. "Nothing to it, nothing at all."

Ishmael reached Mach 1.03 (1.03 times the speed of sound) at 40,000 feet above the Mojave Desert at Edwards Air Force Base.

"It just barely got supersonic," says Ishmael. "At those speeds, the shock waves are really just beginning to get established."

In contrast to Chuck Yeager's assault on the sound barrier as dramatized in *The Right Stuff*, there was no drama at all, says Ishmael. Grumman engineers predicted the plane's behavior for its first transonic step and the X-29 followed their predictions.

Between flights, engineers pore through test data. "Between 700 and 800 manhours are spent between one flight and the next," says Ishmael.

Historic Team. *On December 17, 1985, NASA test pilot Steve Ishmael (R) eased the Grumman X-29 through the sound barrier. At NASA's Ames-Dryden Flight Research Center in Edwards AFB, California, (L to R) Air Force Lt. Col. Ted Wierzbanowski, NASA's Rogers Smith, Grumman Chief Test Pilot Chuck Sewell, Ishmael and Grumman's Kurt Schroeder (not available for photo session) continue alternating command of the X-29 on its current one-flight-a-week schedule.*

"We know a lot about the whole system when we get to a point in the test program.

"What's interesting is that there really is no change in the airplane's behavior," says the NASA test pilot, commenting on the historic flight. "The X-29 compensates."

"In the ground station we saw jumps in the air data when it went supersonic," says test conductor Erik Tobiason, the pilot's contact on the ground. "For the pilot, it was transparent."

According to Ishmael, because its flight control system is so powerful, the X-29 flies rock-steady. If there are any weaknesses, they haven't shown themselves. "We're just starting to touch the area where that's relevant," says Ishmael.

In late winter, the four X-29 pilots will be putting the plane through the difficult transonic and supersonic maneuvers it was designed to do. ■

Tachonics To Plant Roots In Garden State

On January 8, Grumman announced the selection of Plainsboro, New Jersey, as the site for its newly formed Tachonics Corporation. An autonomous affiliate of the Electronics Systems Division, Tachonics was established last summer to design and manufacture integrated circuits with the chemical compound gallium arsenide.

Tachonics will occupy a 35,000 square-foot building being leased from Linpro Company. The site is a commercial park on Morgan Lane in Plainsboro, near Princeton.

"We wanted to be located in a high-tech area with proximity to good schools and research facilities," says Tachonics President Dr. Chuni Ghosh. "In Plainsboro, we are close to Princeton and Rutgers – both very fine schools. And we intend to tap their resources, in terms of manpower and research facilities, as we grow."

The building will be customized to house research, development and fabrication operations and a staff of 40 employees.

The new facility is expected to be operating in the first quarter of 1986. Tachonics hopes to begin delivering gallium arsenide microchips by the end of the fourth quarter this year.

Tachonics' microchips will compete with the more familiar silicon-based semiconductors in both the military and commercial markets. While currently more expensive to produce than silicon, gallium arsenide offers superior qualities including operation at higher speeds and the ability to handle higher frequencies. The material is also more resistant to radiation – ideal for military uses.

Particular commercial applications for gallium arsenide are seen in high speed, next generation computers where domestic and foreign supercomputer manufacturers are already experimenting with the material. In the military market, gallium arsenide is already being used in components for microwave communications, such as radar and electronic countermeasure equipment.

Tachonics will develop and manufacture custom and semi-custom gallium arsenide integrated circuits for Grumman products and for commercial sale. The company will bid competitively as a supplier to Grumman along with other gallium arsenide integrated circuit vendors. ■

Board Elects Three

Last month, the Grumman board of directors elected Renso Caporali, Dan Huebner and John O'Brien members of the board, effective January 1, 1986.

Caporali is president of the Aircraft Systems Division. Huebner is Grumman Corporation's senior vice president-Corporate Development and Marketing. O'Brien is president of the Data Systems Division.

Carr Retires As Vice Chairman After Distinguished 30-year Career

On December 31, 1985, Grumman vice chairman John Carr retired from the company after an illustrious career that spanned three decades. Since 1981, Carr had directed the activities of Grumman's Washington, D.C., office.

During World War II, Carr flew Grumman fighters for the U.S. Navy. After the war, he attended Harvard University Law School and received his LL.B. degree in 1948.

After two years with a New York City law firm, he served as an attorney in the Office of General Counsel of the U.S. Navy from 1950 to 1953. The following two years, he worked at Minneapolis-Honeywell Regulator Company.

Carr joined Grumman Aircraft Engineering Corporation in 1955. Five years later, he was appointed general counsel. He became corporate secretary in 1966 and remained in that position when the company was restructured into Grumman Corporation in July 1969. The following year, he was elected a corporate vice president.

From 1960 through 1972, Carr was the company's general counsel. In December 1972, he assumed the responsibility for administration of the parent company.

In May 1976, he was elected to the Grumman Corporation board of

John Carr

directors and in 1978, vice chairman of the board. In recent years, he served on the board's Corporate Responsibility Committee.

Carr is a member of the American Bar Association and the Economic Policy Council of the United Nations Association.

Upon retiring from Grumman, Carr joined the law firm of Zuckert, Scoutt, Rasenberger & Johnson in Washington, D.C. ■

Is It Okay, Vic? *Metallurgical engineer Vic Romaker studies the surface of the first part forged in a new die. He's looking through a stereoscope, which shows him a 30X, three-dimensional magnification of the surface of the forging. As a member of Quality Laboratory Operations in Plant 10 in Bethpage, his job is to look for flaws in this part before the die is okayed for production.*

Truck Owners Find Piece In Mayfield's Spares Shop

A Brooklyn deli is out of potato chips because a Frito-Lay delivery truck had a fender-bender. The heater in a TV repair truck is kaput in Minnesota. In New Mexico, a neighborhood bar is running low on beer, because the distributor's truck is out of commission.

Sooner or later, these Olson truck owners will call Grumman Olson's Mayfield, Pennsylvania, facility, tucked in the mountains just northeast of Scranton. Since 1980, the spare parts operation for Allied's truck building unit has been consolidated in Mayfield. And that business has been going gangbusters.

"Since we took over spares in 1980, sales have more than tripled," says general manager Bob Hickey.

Only a small part of the Mayfield operation is dedicated to spare parts sales. Mayfield's biggest program is the rebuilding of veteran Grumman trucks. The Grummanites also manufacture new trucks.

Like old Volkswagen Beetles, Grumman aluminum delivery trucks seem to last forever. Yet, parts do break. And with over 100,000 Grumman trucks on the road, there is a large spare parts market.

"Last year, a guy came in here looking to see if he could buy some parts," says Spare Parts manager Rob Hibbard. "He turned out to be a 49-vehicle fleet owner."

Since 1982, Grumman Olson has been spreading the word about its spare parts service. "We started putting a label in every vehicle: 'For Service Call: 1-800-233-4823,'" says Hibbard. The company also sends spare parts information to buyers who return warranty cards.

Grumman trucks have long been popular with both one-truck owners and big fleets like Frito-Lay, the *Philadelphia Enquirer*, and Campbell Taggart, a division of Anheuser-Busch.

Get An Earful. *At the Spare Parts department at Grumman Olson in Mayfield (Pa.), most of the workday is spent on the phone. Jerry Wingotich and fellow workers handle 60-80 calls a day during the summer — and double that in winter.*

"I've seen United Parcel trucks with a million miles," says Hickey. Hibbard adds, "The oldest one I know of that's still on the road is a 1947 — which we sold parts for this year. A caterer has it down in Maryland. He has a couple of others, but this one is his showpiece."

Today's Grumman trucks look a lot like the first ones, which came off the production lines after World War II. "But when you get back into the 40's and 50's there aren't too many parts that are interchangeable," says Hibbard. "In 1963, federal safety regulations required more design changes."

Mayfield also stocks parts for rare models, such as the 392 motor homes, the armored vehicles and ambulances that Grumman once manufactured. "We were involved with Mercedes Benz for a time," says Hickey. Grumman put truck bodies on MB chassis. "Those chassis were fantastic. Just the chassis cost from 18 to 20 thousand dollars."

As the spare parts business increases, Hibbard's team spends more time on the phone. Owners call the Spare Parts department 60 to 80 times a day during the summer months. In winter, when things like a broken heater become important, the number of calls doubles.

While the message that Grumman sells truck parts is getting around, sometimes the message gets a little garbled. "One time a guy tried to buy spare parts for an AgCat from me," Hickey recalls. An AgCat is a biplane cropduster that Grumman once manufactured. "Another time, I got a call for a Lunar Module support trailer."

Keep those calls coming. ■

Pearson Sold

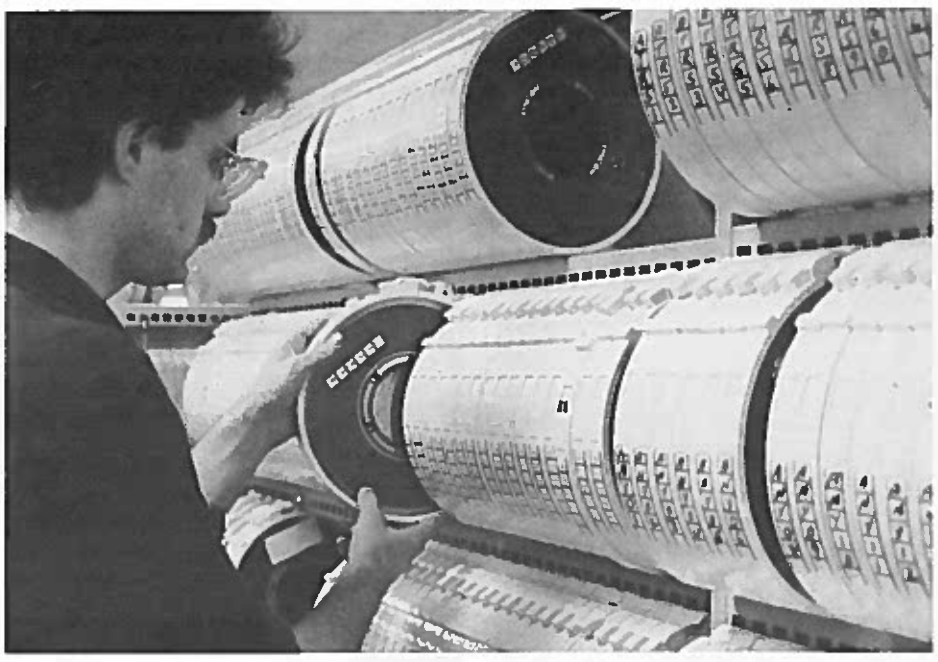
Grumman Corporation is selling its Pearson Yachts unit to the newly formed Pearson Yachts Corporation for an undisclosed amount of cash and notes.

J. Gordon Clayton of Greenville, South Carolina, is president of the new corporation, which is incorporated in Virginia. Existing management will remain with the company. Wells Darling, senior vice president - Marine of Grumman's Allied Division, will serve as consultant. William Shaw, presently senior vice president of Marine Products at Pearson, becomes executive vice president.

"Pearson is the finest quality production yacht in the world," says Clayton. "By continuing the operation in Portsmouth, Rhode Island, and keeping all the present Pearson management active in the new company, we believe solid growth will continue at Pearson."

Clayton points out that although the U.S. sailboat market was down in 1985, Pearson increased its market share with three new models, from 28 to 36 feet.

Grumman announced in August, 1985 that it was seeking a buyer for Pearson, which employs 250 workers. Grumman acquired Pearson in 1960, and Pearson's annual gross sales exceed $20 million.



Information, Please. *Grummanite Dave Nelson chooses a tape from the Welfare Management System data base. WMS contains information on two million past and present recipients of public assistance, Food Stamps and medical assistance in New York City. This information enables case workers to properly research each application they receive.*

N.Y. State Extends Data Systems Work

Support work to continue on welfare system for Big Apple

New York State has extended its pact with Grumman Data Systems for support work on the Welfare Management System (WMS) operation in New York City.

The Data Systems Division began work January 1 on the two, six-month contract extensions. Though financial details are still being worked out, it could mean about $3.6 million in business.

The Welfare Management System is a State-funded program. The Department of Social Services will use it to process requests for public assistance, Food Stamps and medical assistance.

Back in 1982, Data Systems began writing the computer software for WMS as a subcontractor to Sperry, the maker of the computers. Then, in 1984, New York State awarded the division a contract for the management of the facility. This meant managing and operating the computers at the City's Eighth Avenue and 14th Street site, getting the system running and training New York City personnel to take over the operation.

"Right now the baseline system is being piloted at several Food Stamp Welfare offices," says Commercial Systems development manager Lance Hugelmeyer. "Over the next several months, we'll expand the production system to service both the medical assistance and public assistance functions." The Data Systems team in the city will be running training programs over the next six months as well.

The Facilities Management team peaked at 54 people in December and will be reduced to 22 by June. "Those who are coming off the program are mostly operators," says Dennis Pelehach, director, New York State Commercial Programs. "They will be relocated to Bethpage Operations, Holtsville, and our Convention Center job in New York City."

The applications team will remain at around 40 people through the program. At present, their assignment is to support the pilot program and modify WMS computer programs or write new ones.

When the two job extensions are up in June, the State has options to extend Data Systems' Facility Management effort in New York City for as much as a year. It can also extend the work of the WMS Applications Development team in Woodbury for another six months. "If the State exercises all its options," says Pelchach, "we could be talking about $6.5 million in business during 1986."

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Technical Services Names Five

Grumman Technical Services Division has established its division headquarters organization. As a result, Division President Fred Haise announced five appointments.

Pat Ranieri has been named assistant to the president; Bob Bozza, director of Business and Financial Operations; Stu Cornell, manager of Management Information Services; John Schwarz, manager of Finance and Accounting; and Joe Klimek, staff assistant for Business Development.

New Subsidiary To Invest In High Tech Ventures

At the end of 1985, Grumman unveiled a new subsidiary that will give the company a pipeline to more research and development activity than it could ever afford to generate in-house.

Called Grumman Ventures, Inc., this wholly-owned subsidiary will seek out high technology investment opportunities. Grumman Ventures aims to make a good rate of return on the money it invests, but its primary purpose is to enhance Grumman's technological base.

"New technologies are the future of Grumman, and we realize that not all these can be self-generated," says Grumman Chairman Jack Bierwirth. "Grumman Ventures will enable us to stimulate the development and growth of new products and businesses through external sources."

A major source will be the venture capital community. "The venture capital community consists of about 500 firms that pool their own financial resources with those of other firms and institutions to invest in emerging high-tech companies," says Steve Dondero, the new president of Grumman Ventures and Grumman Corporation's director of New Business Ventures. "A medium-size venture capital firm, for example, might have as many as 30 high-tech companies in its investment portfolio.

"By investing in funds managed by these firms, Grumman will gain access to those high-tech companies as well as their innovative products and technologies. We hope that this can satisfy some of our own technological needs," says Dondero. "These investments will also complement our internal research-and-development programs."

"The strengths of proven venture capital firms are their knowledge of the marketplace and their access to management talent to operate small companies," adds Bill Parmentier, assistant treasurer of Grumman Corporation and newly appointed vice president and treasurer of Grumman Ventures. "Grumman will add its technological capability to the process. Get those three together and you have the key to success."

Initially, Grumman Ventures will make its investments in limited partnerships managed by venture capital firms with good track records. These firms make calculated risks, but they spread their investments to minimize the losses.

Still, the financial returns can be good. According to a recent article in *Fortune* magazine, the average annual return on investments by the venture capital industry was estimated at 20 to 30 percent in the decade ending 1984. An investment in the Standard & Poor's 500 index would have returned about 14.6 percent over past 10 years.

"We are looking at long term investments for both technological and financial gains," says Parmentier.

Dondero and Parmentier know they have a lot of research ahead of them. "We first have to identify the near- and long-term technological needs of our own company, and then find what the venture capital firms have to offer before we select our investment partners," says Dondero. "Our initial investment may be made toward the latter part of 1986." ■

St. Augustine Bids Adieu To A-4 Malaysian Program

When the final four A-4 Skyhawks touched down on January 7 at the Kuantan airbase in Malaysia, it marked not only the end of a 12,000 mile flight, but the end of Grumman St. Augustine's $125 million A-4 refurbishment program for the Royal Malaysian Air Force.

"This was a big success story for us," says Grumman St. Augustine President Joe Walter. "It put St. Augustine into the modification and overhaul business and allowed the workforce to mature into a fine professional team."

In late 1982, the division began refurbishing 40 single seat A-4s that the Malaysian government had purchased from the U.S. It also modified six of these aircraft into two-seat trainers. Design work and the fabrication of the instructor's cockpit for each trainer was done in Bethpage. The reworked Skyhawks were given the designations A-4 PTM (Peculiar To Malaysia) and TA-4 PTM.

The Malaysian A-4 refurbishment program was quite an undertaking. "It marked the first time Grumman has taken on an overhaul and modification job for a non-Grumman aircraft in a non-U.S. military situation," says Marty Dandridge, vice president of Programs and Business. He had responsibility for the entire A-4 effort, both in Bethpage and St. Augustine.

"On some days, people worked 18 hours to meet production milestones – and every milestone was reached right on schedule," he says. "We also trained 60 Malaysian pilots and maintenance personnel, wrote publications, provided logistics support and more."

Named for the Florida city it's located in, Grumman St. Augustine was established in 1980 to rework and modify aircraft. Because of the A-4 program, the number of people at the division peaked at 1,000 last August. The current workforce is 930.

"We're actively pursuing a variety of new jobs," says Walter. "Most of the people who worked on the A-4 program are now working on our KA-6D, A-6E, S-2, TC-4C or HU-16 programs. We expect to win some exciting new programs soon. We're bidding on a major A-4 refurbishment job for Kuwait, and we're looking at some more work for Malaysia. We are also doing the initial engineering work to re-engine some A-4s with General Electric F404 engines for Singapore." ■

Of Widgets, Whatchamacallits, And Better Mousetraps

Creative thinking by Grummanites results in a variety of patented inventions

By now, somebody, somewhere has called Dr. Pat Barry's invention a "gizmo."

Dr. Barry created a device to sift through the staggering amount of information gathered by surveillance satellites. He is a system scientist in Corporate Research and also serves as a program director in Grumman's Space Division. His invention, U.S. patent number 4,482,970, earned him the title of Grumman Inventor of the Year for 1985.

A patent serves a two-fold purpose for the company: recognizing the creative skill of the Grumman inventor, and providing Grumman with a legal right to prevent others from using the patented information unless authorized by Grumman.

'Many quietly tinker away, never realizing that their achievements are indeed inventions.'

The catch is, the Grumman inventor must pursue the matter. At Grumman, many would-be patent holders quietly tinker away, never quite realizing that their achievements are indeed "inventions."

"Grummanites tend to think everything they do is so simple, that it's already been done by someone else," says Dick Geib, Grumman's chief patent counsel. "They don't beat a path to the Patent Department's door because they feel what they've come up with isn't patentable. They're a bit too quick to prejudge the situation."

One unusual invention –for the aircraft world, at least – is patent number 4,531,241. It's a cushioned glove that protects assembler/riveters from vibration-related hand and wrist ailments, and was invented by Saul Berger, Plant 1 safety representative in Bethpage.

Folded, Berger's glove looks like a waterproof, fabric wallet. Fastened by velcro tabs to a person's palm and wrist, it looks like a bowler's wristband.

Typically, one assembler/riveter operates the rivet gun, while a second holds a bucking bar in place, producing a finished rivet. The constant movement can result in a painful condition of the hand and wrist called carpal tunnel syndrome.

An existing leather glove affords protection, but it's heavy and restricts hand and wrist movement. Berger's is made of lightweight rubberized cloth and Ensolite (a trademarked upholstery padding). "I was inspired by the type of brace worn by someone with a sprained wrist," he says. "So I went to Medical and got a dozen of 'em. The Plant 1 upholstery shop put in the Ensolite."

The gloves had good results. One man had complained that his shoulders ached so much at night that he couldn't sleep. Berger suggested he give the new glove a try. "His condition has improved dramatically," Berger says.

Potentially, the glove might appeal to people who have pain from constant wrist movement. That might include computer users, secretaries, typists, painters, and other production people besides assembler/riveters. Grumman's Business Development department is now seeking possible licensors.

At the other end of the technical stratum, Dr. Pat Barry has gotten used to the puzzled expressions of lay people when he discusses his Boolean filter. The invention now exists solely on paper, but in three-D, it would be tiny – about the size and shape of one of those soldered squares found on an electronic circuit board.

The Boolean filter would enable faster, more accurate processing of information gathered by the satellite's infrared sensors.

"A surveillance satellite would take an infrared picture of the entire earth," says Barry, who is fast to insist that the invention wasn't his work alone, but a team effort among Research scientists.

"Within that picture would be millions of tiny elements called pixels – roughly analogous to the dots making up a halftone picture in a magazine."

Boolean logic was named after George Boole, a 19th Century mathematician. It arrives at an answer using yes-no, true-false reasoning, rather than using arithmetical logic. The Boolean filter in a satellite would apply this logic to friend-or-foe identification.

"The Boolean filter would filter out those pixels that wouldn't be foes. And the process would be much faster than arithmetical logic," says Barry. "While the Boolean filter supports existing Grumman programs in satellite systems, it can be applied to any surveillance system with a large field of view."

Another "hot" technology is integrated optics. Dr. Ben Pernick of Grumman's Corporate Research Center just received his sixth patent. Pernick's *A Signal Device Employing Photoreactive Area Modulation* exists only on paper and is still in a research stage. Scientists would use it to "write" data, using lasers, onto ultra-thin films for applications such as spectrum analysis.

"Integrated optics is a kissing cousin to the more mature fiber optics field, which is now playing a major role in telecommunications," explains Pernick. The soft-spoken laser physicist was on the Grumman team that a decade ago patented a laser-based technique for reading Pap smears.

Someday, integrated optics could well supplant digital electronics in computers. Because there would be no electrical impulses in the optical section, such a computer would be immune to electromagnetic interference.

"In principle, an optical computer could perform certain functions much better than its electronic counterpart – for example, analyzing weak radar signals," says Pernick.

He pauses, then cautions: "All this is still what the technology *promises*. We're still very much in the "R" of the research-and-development cycle. But I feel optical technology will soon make inroads into computer design. Look at how laser technology has taken off with laser disk players."

'The Legal Department often fields queries from outside the company.'

An patent can result from an improvement to an existing product. For example, the air-pressure-operated water pump governor (i.e., regulator) from Grumman Emergency Products was first part of the Nozzle Pump Operator (NPO), a remote control system for operating firefighting equipment.

The NPO program hit some snags; the sophisticated high-tech nozzle system proved to be too delicate for the rugged world of firefighting. When it was halted several years ago, each of its components was judged for marketability. "We found that the governor portion had worked successfully and had advantages for water pressure control on fire pumpers," says Del Bilyeu, Allied's Emergency Products vice president of Engineering in Roanoke, Virginia. "And it was never patented apart from the system. So we applied for a second patent for just the governor."

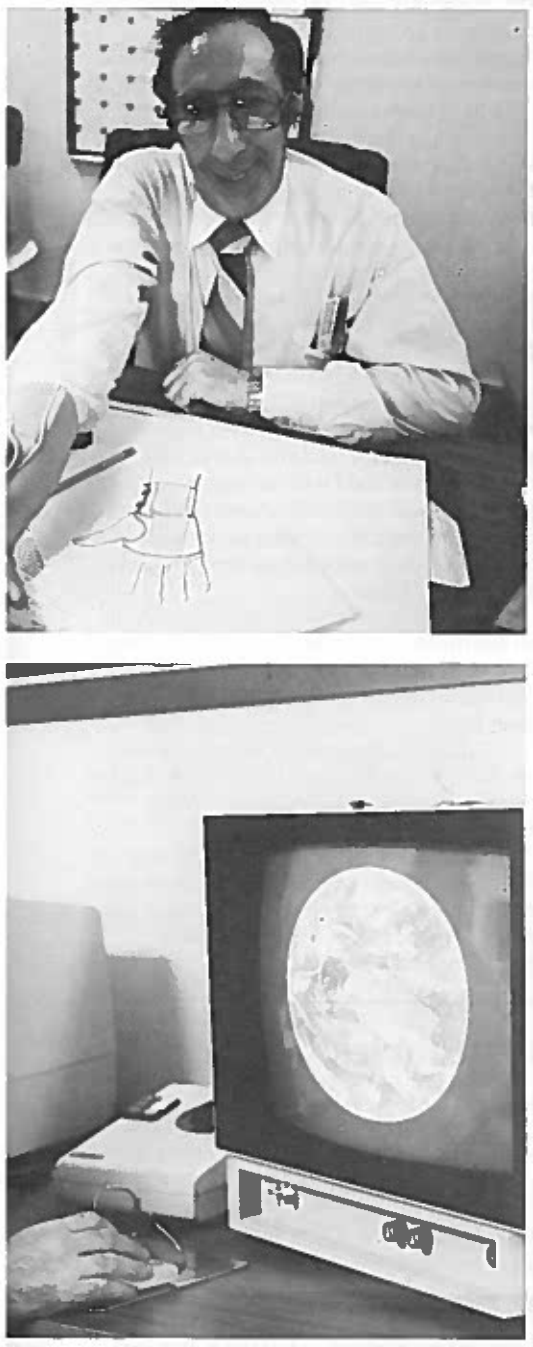
Handy invention. *Saul Berger (top photo) wea from vibration-related ailments. Above, Dr. Pat tion of earth. His invention would form part of a*

When the governor is used with a pumper, the fireman selects a setting, and the governor advances automatically to it. It senses pump discharge pressure and raises or lowers the pump's speed to maintain the desired level. The new version had one modification: a mechanism was added to return it to idle speed in the event of loss of input water.

The Legal Department often fields queries from outside the company – and on some occasions, Grumman has obtained patents based on inventions by a non-employee. Geib admits that people from the outside have to be more persuasive to get their ideas considered.

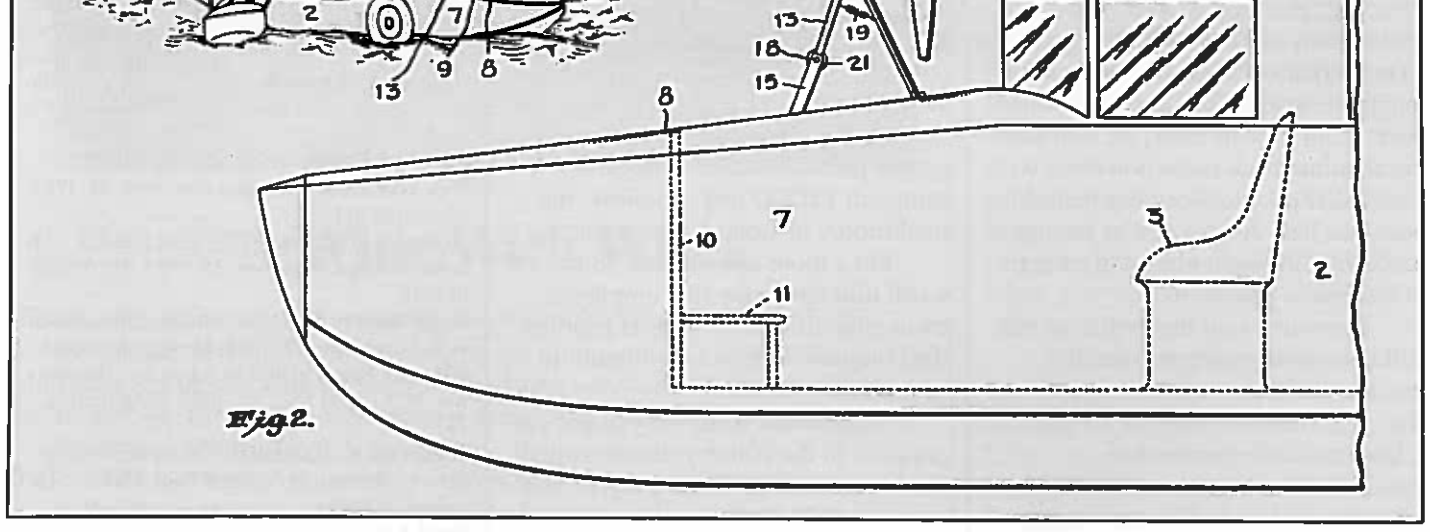
"However, no idea is given short shrift," he says. "More are rejected than accepted; however, that's mainly because most of the ideas are outside our areas of interest.

"The suggestions come from youngsters in elementary school, all the way up to retirees," he adds. "Obviously, the youngsters submit some very rudimentary drawings. But I don't think any inventor should have his ideas criticized as outlandish. Most have applied creative thinking to problem solving – and that's what characterizes an inventor." ■



New Light. *Dr. Ben Pernick conducts an experiment in the laser laboratory, part of the new Corporate Research Center. He recently patented a device that laser scientists would use to conduct experiments in integrated optics — a technology that promises to play a big role in future electronics devices.*

lightweight glove. The glove protects the hand
y works at a screen bearing a computer rendi-
e satellite.



Grumman's Flying Boat Solved A Vexing Problem

The first Grumman patent was issued on April 7, 1931 to company founder Leroy Grumman for a *flying boat and like craft*. It was the precursor to later Grumman amphibian aircraft.

Air/water craft already existed at the time, but one aspect of their design was inconvenient: in docking, their propellers had to be shut off.

Turning off the props was necessary so a crew member could go safely from the cockpit to the front deck of the seaplane. From there, he roped the plane to the dock. The props also had to be off so to allow passengers to embark or disembark.

However, with its propellor off, the plane would drift with the wind, making docking dangerous, difficult, and time-consuming.

Grumman designed an enclosed passageway beneath the propeller, a front entrance ahead of it, and a hatch cover that acted as a shield. The person with the rope could stand on a step in this passageway, raise the hatch cover, and throw the rope. ■

A Few Tips For Would-Be Leonardos

"When I heard what Dr. Barry had invented, I still didn't know what he invented," joked Grumman Chairman Jack Bierwirth at a recent reception honoring Grumman patent holders.

He referred to the Boolean filter invented by Dr. Pat Barry, the Grumman Inventor of the Year for 1985. The 148 other patent holders were given sterling silver pins shaped like paper clips with a Grumman logo in the middle. They commemorate Leroy Grumman's brainstorm, which led him to invent the folding aircraft wing.

Here's a short quiz. Which of the following items may *not* be patented by Grumman?

(a) Inventions for Defense Department projects.

(b) Inventions for NASA and Energy Department projects.

(c) Manufacturing tools or processes.

(d) A new idea that's still in a rudimentary stage.

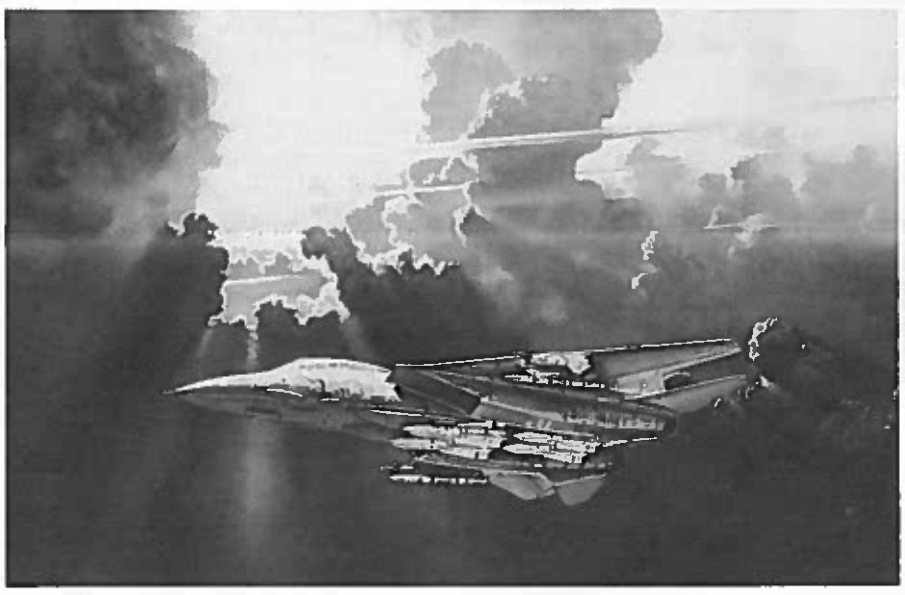
(e) Features added later to that rudimentary idea.

(f) Eliminating a production step to streamline an operation.

(g) Adding steps to obtain a new result.

If you circled (b), give yourself a gold star. Except for NASA and Department of Energy programs, Grumman retains commercial rights to inventions on government work. Military rights are licensed to the government.

Bernie Hoffman of the Grumman Patent Department can assist employee inventors. He may be reached at Ext. (111) 53830 (516-575-3830). Or, you may call the Patent Department at Ext. (111) 53330 (516-575-3330).



Artistic Air Show. *Long Island artist Attila Hejja recently completed a series of realistic oil paintings depicting Grumman aircraft in action. Three of the paintings are shown here: (top) EA-6B Prowler;(above) E-2C Hawkeye; and (left) F-14 Tomcat. Four-by-six-foot photo enlargements of Hejja's paintings will be on display in the corporate headquarters building in Bethpage in the near future. Hejja's work also hangs in the Pentagon, the National Air and Space Museum, and in galleries and museums around the world.*

25-Year Club Welcomes Class Of '85

On Tuesday, December 10, over 3,500 people attended the 1985 25-Year Luncheon at The Colonie Hill in Hauppauge, Long Island. Packed elbow to elbow in the cavernous banquet hall, attendees greeted each other as if they were long lost relatives at a big wedding.

The luncheon's highlight was the presentation of engraved gold watches to 245 Grummanites who marked 25 years of service with the company in 1985.

Joining the honorees were Grumman retirees and current employees who had previously reached the 25-year service milestone. Chairman Jack Bierwirth noted that the festivities reminded him of a class reunion and that the annual affair "epitomizes the concept of the Grumman Family."

Noting the size of the 1985 gathering, Bierwirth announced that future 25-year luncheons would be scaled down to a more "comfortable and manageable size.

"While it's always wonderful to get the family together, under the current system, the luncheon has grown so large that we've lost the personal touch," he said. "On top of that, three years from now in 1988, we will have the absolute peak induction class with over 1,200 people receiving their 25-year watches. As it is, we're having a hard time finding a place big enough to hold us."

Bierwirth said that while he was still open to suggestions, future luncheons will use a system based on five-year intervals, similar to high school and college reunions.

For instance, those individuals who received their 25-year watches at this year's affair will be invited to the 1990 luncheon.

Bierwirth also told the audience about Grumman's plans to build its own power plant in Bethpage. "While the private generator would help protect Grumman from rising energy costs, it can't protect our people at home. And the cost of living on Long Island is ultimately reflected in our payroll here," said Bierwirth.

"We must continue to work with state and local authorities and with LILCO (Long Island Lighting Company) to find a suitable solution to save all of us on Long Island from the fate that I see coming if we continue on our present course – the bankruptcy of LILCO and, possibly, the bankruptcy of Long Island industry."

On a more upbeat note, Bierwirth told the group that employee ownership of Grumman had enabled the company to make significant investments in its future.

"Grumman is the only major corporation in the country that is owned almost entirely by its employees and retirees. Self ownership gives us strength. Because of it, we have been able to make long-term investments for our future.

"I believe we will see Grumman double its size by the 1990s," continued Bierwirth. "The opportunities are out there. Through the dedication of our work force as exemplified by all of you here today, Grumman will be making the best of these opportunities well into the 21st century." ■

Personals

My family and I wish to express our sincere thanks and appreciation to all of our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of my wife. **Frank Glaab and Family**

I wish to thank all of my friends and co-workers for their kind expressions of sympathy during the recent loss of my mother Lillian. **Jerry Strange**

My family and I wish to express our sincere appreciation to all my friends, co-workers, and ESO for their kind expressions of sympathy during the recent loss of my wife. **Joe Pierro**

My family and I wish to thank all my friends, co-workers and ESO for their kindness and thoughtfulness during the recent loss of my mother. **John Asciutto and Family**

My family and I wish to express our sincere thanks and appreciation to all our friends, co-workers and ESO for their kind expressons of sympathy during the recent loss of my wife Mary. **Jerry Ednie**

We wish to express our sincere thanks to all our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of our daughter Christine. **Bob and Joan Duffy**

I'd like to thank all my friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of my mother Jennie Trifaro. **Lucy Giordano**

To all of our friends at Grumman, my wife and I would like to express our thanks and appreciation for your kind expressions of sympathy upon the loss of her mother Adele Schaeffer. **Mark Siegel**

Obituaries

Robert G. Moore of E-2C Wings/F-14 Weapons, Stuart, died Dec. 3, at the age of 43. He had been with the company since 1982 and resided at 332 Cherryhill Rd., Port St. Lucie, Florida.

Joseph A. Voreck of FTT Systems, Bethpage, died Dec. 10, at the age of 41. He had been with the company since 1976 and resided at 461 Richland Blvd., Brightwaters, N.Y.

Henry L. Aptaker of Sci. & Tech. Sys. Application, Bethpage, died Dec. 13, at the age of 54. He had been with the company since 1966 and resided at 275 Division Ave., Levittown, N.Y.

Retiree Obituaries

Fred H. Rosener of 3308 Merion Ct., Virginia Bch., Virginia, died Oct. 15, 1985. He retired in 1961.

Francis Hanratty of 2 Forest Row, Great Neck, N.Y., died Nov. 5, 1985. He retired in 1967.

Clarence S. Wetmore of Canton Prof. Center, Canton, N.Y., died Nov. 13, 1985. He retired in 1962.

August W. Schmidt of 6760 NW 24 Pl., Sunrise, Florida, died Nov. 20, 1985. He retired in 1965.

Franklin J. Kelly of 28 14 Cavendish Ct., New Port Richey, Florida, died Nov. 24, 1985. He retired in 1975.

Arthur N. Higdon of 2008 Live Oak La., Apopka, Florida, died Nov. 25, 1985. He retired in 1978.

Ratje Bunke of 259 Howell Ave., Riverhead, N.Y., died Nov. 25, 1985. He retired in 1968.

Alfred J. Stern of 405 W. Main St., Huntington, N.Y., died Nov. 27, 1985. He retired in 1973.

Frederick E. Randall of 555 N. Newbridge Rd., Levittown, N.Y., died Nov. 27,1985. He retired in 1969.

Emil J. Ziomek of 2310 Edward Rd., Lake Park, Florida, died Nov. 28,1985. He retired in 1978.

Peter Peyrat of 32 Murray Pl., Merrick, N.Y., died Nov. 30, 1985. He retired in 1973.

John Podkanowicz of 3 Chestnut St., Greenvale, N.Y., died Dec. 3, 1985. He retired in 1976.

George Litsch of 205 Lynn Ave., East Northport, N.Y., died Dec. 6, 1985. He retired in 1971.

John M. O'Donnell of 578 Hawthorne St., Massapequa, N.Y., died Dec. 6, 1985. He retired in 1972.

Leo Fischer of 2600 SE Ocean Blvd., Stuart, Florida, died Dec. 8,1985. He retired in 1983.

Blood Program Hopes For A Healthy '86

For those associated with blood banks, January is one of the worst months.

In January, chronic shortages of blood become a crisis. Donations take a nosedive as snow and ice keep people at home. College students – among the most generous donors – are on recess for much of the month. Even in balmier climes, people catch colds, and can't donate.

"At the same time, the need is especially acute during January," says Gerry Sandler, senior vice president, Information Systems for the Data Systems Division and 1986 chairman of the Grumman Blood Program. For example, there are more car accidents, and there are winter epidemics to cope with.

The need for blood donations is ever-increasing, no matter what the date. As research finds new ways to treat illness, and as the population ages, more medical care is given and more blood is required. At the same time, people aged 66 and up cannot give blood.

Most people will probably receive blood at some point in their lives, but only about four percent of Americans ever get around to giving it. Long Island Blood Services uses 700 to 800 pints of blood a day, and one third of that must be imported.

Long Island Blood Services must buy a lot of its blood from Belgium, Germany and the Netherlands. Because these countries suffered heavy casualties during the two world wars, their citizens have a greater awareness of the need for emergency readiness – including blood donations.

The Grumman Blood Program works to instill that awareness among Grummanites on Long Island – with growing success. Long Island Grummanites donated over 10,800 pints in 1985, well in excess of the year's goal and almost twice the amount collected when the program began in 1981. Grummanites now donate 10 percent of Long Island Blood Services' supply.

Peter Goldsmith, 1986 Blood Program director, says that despite the good show last year, there's always room for improvement. "Grumman's multi-donors save the day," he notes. "Only 20 percent or less of the Grumman Long Island population donates. It's a matter of educating people. It's not a bad experience. In fact, it's a very satisfying experience knowing you may save someone's life."

Working with Sandler and Goldsmith are Bernie Kirschbaum, Bob Woolsey and Linda Elwood. They hope to collect 11,500 pints in a total of 105 blood drives, up from the 93 drives in 1985.

To convince more Grummanites to donate, this year's program is adding a new twist to the old "buddy system." When a donor brings along a co-worker who has never given blood before at Grumman, the repeat donor will be eligible for a prize drawing. "Having a friend along makes you more relaxed about giving blood – especially for the first time," says Goldsmith.

Goldsmith himself is a longtime blood captain, so he's used to persuading reluctant co-workers. "I can see people refusing for health reasons," he says. "When people start making Dracula jokes about it, that bothers me. Some day it's going to hit home where a family member or a friend of theirs will need blood. They won't be joking around anymore."

Donating blood is quick and painless, and because a sterile, disposable needle and tube are used, there is no chance of infection. No person has contracted acquired immune deficiency syndrome (AIDS) from *giving* blood.

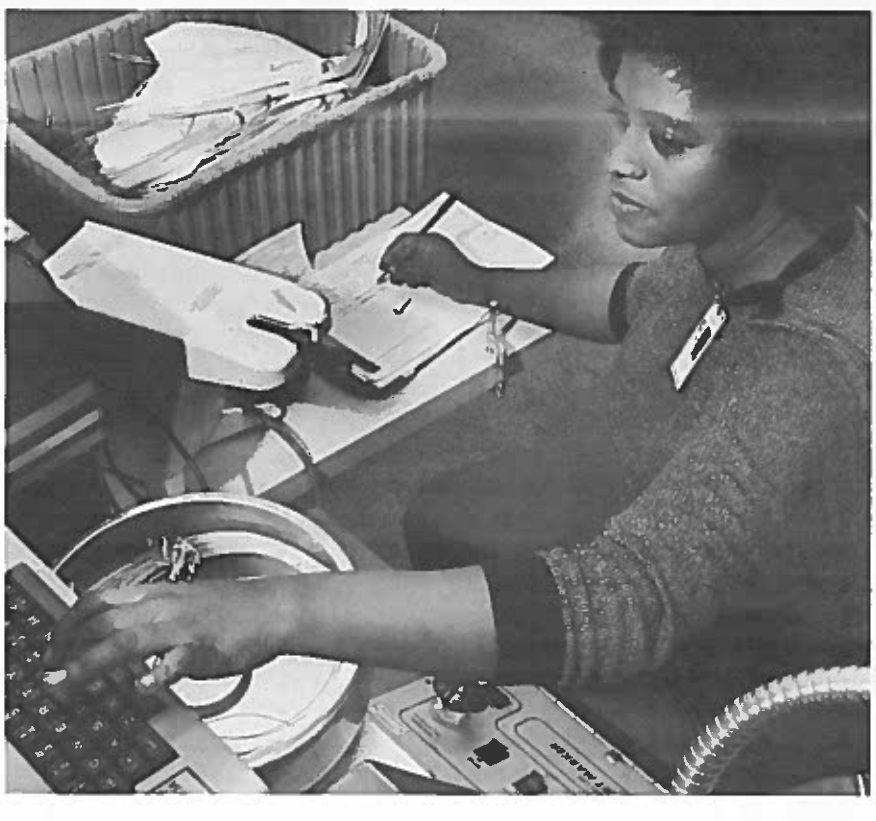
People who raise AIDS as an issue confuse giving blood with catching AIDS from a blood transfusion – which happened in few cases years ago. There is now a test to identify donors who either have the disease, or have been exposed to it. The donor is notified confidentially of his or her condition, and the donor's blood is destroyed or used in research. The important thing to remember is that you can't get AIDS from donating blood.

The Key To Life. *Blood donors help a lot of people like this little fellow who is a hemophiliac, He is undergoing treatment at the L.I. Jewish Medical Center in New Hyde Park.*

This points up a benefit to giving blood that few people realize. Before it can be used, the blood center checks a donor's blood for various communicable illnesses, and notifies the donor if he or she is sick. One Grummanite learned she had hepatitis this way. The disease was arrested before her condition became serious.

Long Islanders are fortunate in that Long Island Blood Services provides blood free of charge to all 41 area hospitals. Only a nominal processing fee is charged. On Long Island, unlike many other locales, you don't have to give blood to "cover" yourself and your family for blood you may need in the future. Thus, giving blood is entirely altruistic. But remember: if there is no blood available, those in need cannot be helped.

To find out more about how you can help, call the Blood Program office at Ext. (111) 58920, (516) 575-8920, or (516) 682-8920. ■



A Whiz With Wires

"It's like threading a giant sewing machine with all different kinds of thread and then letting the machine make your patterns," says Dollie Dozier, electrical wire preparer in Electronics Systems Division's Great River Operations. The difference is the sewing machine is a computer and the thread is wire.

Dozier works on one of two automatic ink jet marker machines used in the Plant 44 wire assembly area. The machine pulls, cuts, stamps, and marks wire bundles according to information fed in by an operator.

"We input what jobs we need wire bundles for, the kind of wiring, and the number of bundles needed and the machine does the rest," says Dozier. "It's a lot faster and easier than making the packages up by hand on the old manual machines."

Using the automatic system, Dozier can make up wire packages for every every aircraft Grumman makes. The machine handles orders for lengths of wire from eight to 1,000 inches long and gauges from thread thin to twine thick.

The system also provides an automatic inventory record and part number sheets for assemblers who use them in the wire harnesses, electronic panels and black boxes made in Great River.

Charge It! Service Centers Begin Billing Each Division

Half of the company's "service centers" – Services Division departments that do work for all divisions – are now required to directly charge back their labor costs to the requesting division.

The service centers, which are primarily part of the cost category known as indirect labor, will use a direct job charging scheme to provide better cost accountability to Grumman management.

Affected departments include Facilities Maintenance - Trades (Long Island); Facilities Maintenance - Cleaning (L.I.); Facilities Engineering (L.I.); Presentations - Report and Proposal Services; Presentations - Visual Services; Presentations - Photographic Services; Reprographics; Document Support Services; Public Affairs' Graphic Design/Illustration and Motion Pictures/TV/Audio-Visual.

Each of these groups has its own set of new, four digit, direct charge codes – and a different one for each Grumman division. Before, most labor was chargeable to the old Aerospace subsidiary.

"This will enable better accounting for costs in the service centers," says Barry Paul, senior analyst for Business Operations - Corporate Budgets. "On the user's end, divisions will be better able to plan and budget their needs."

However, no change will be apparent to most Grummanites. "The person who fills out a work order will not see a change in paperwork – other than the fact that he may have to fill in another blank to identify his division," notes Bruce Bernard, manager of Business Operations - Corporate Budgets. "This charging method does, however, pose a significant challenge to each service center organization. For them, it's a new way of doing business."

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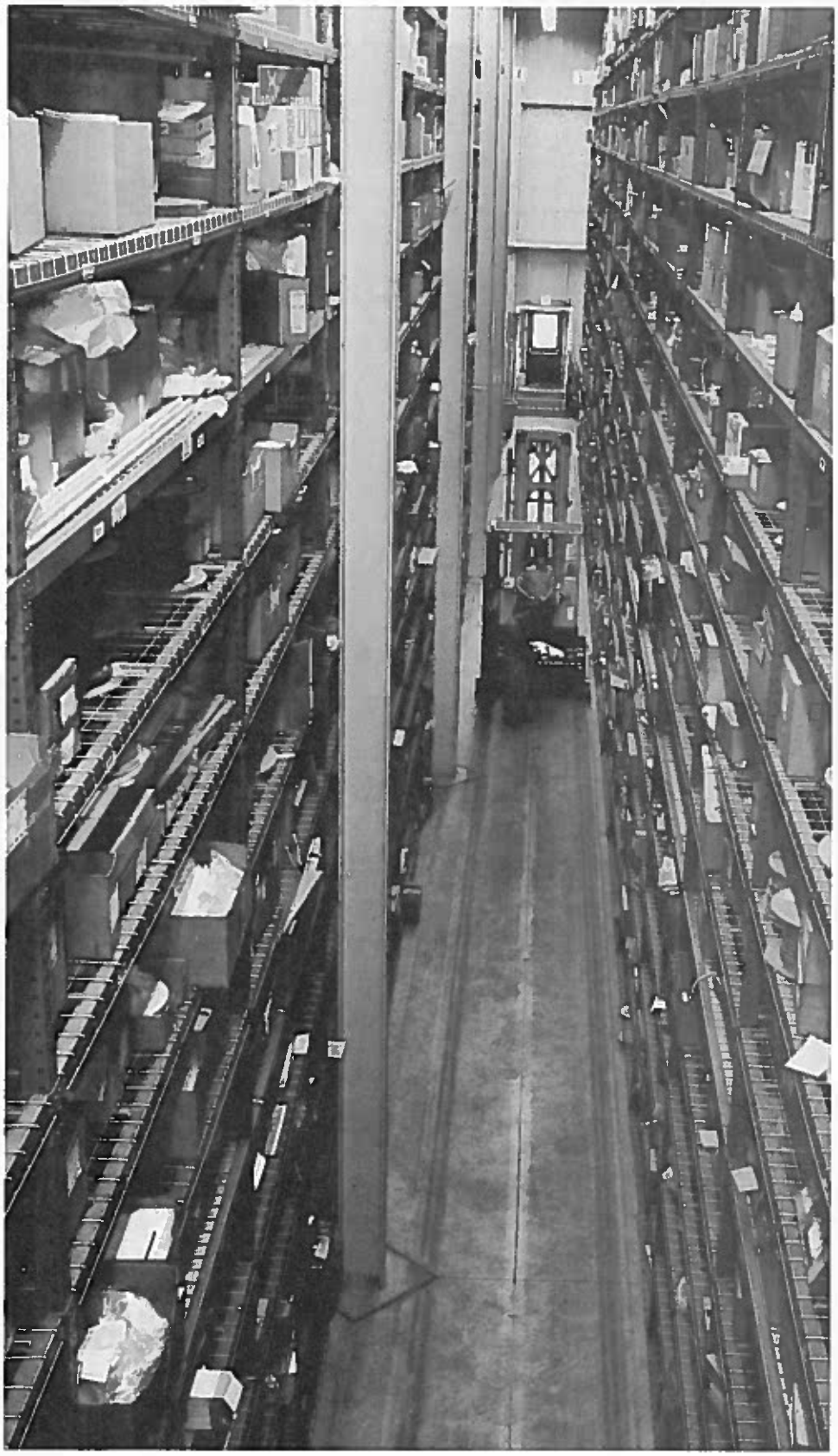
GrummanWorld
January 17, 1986



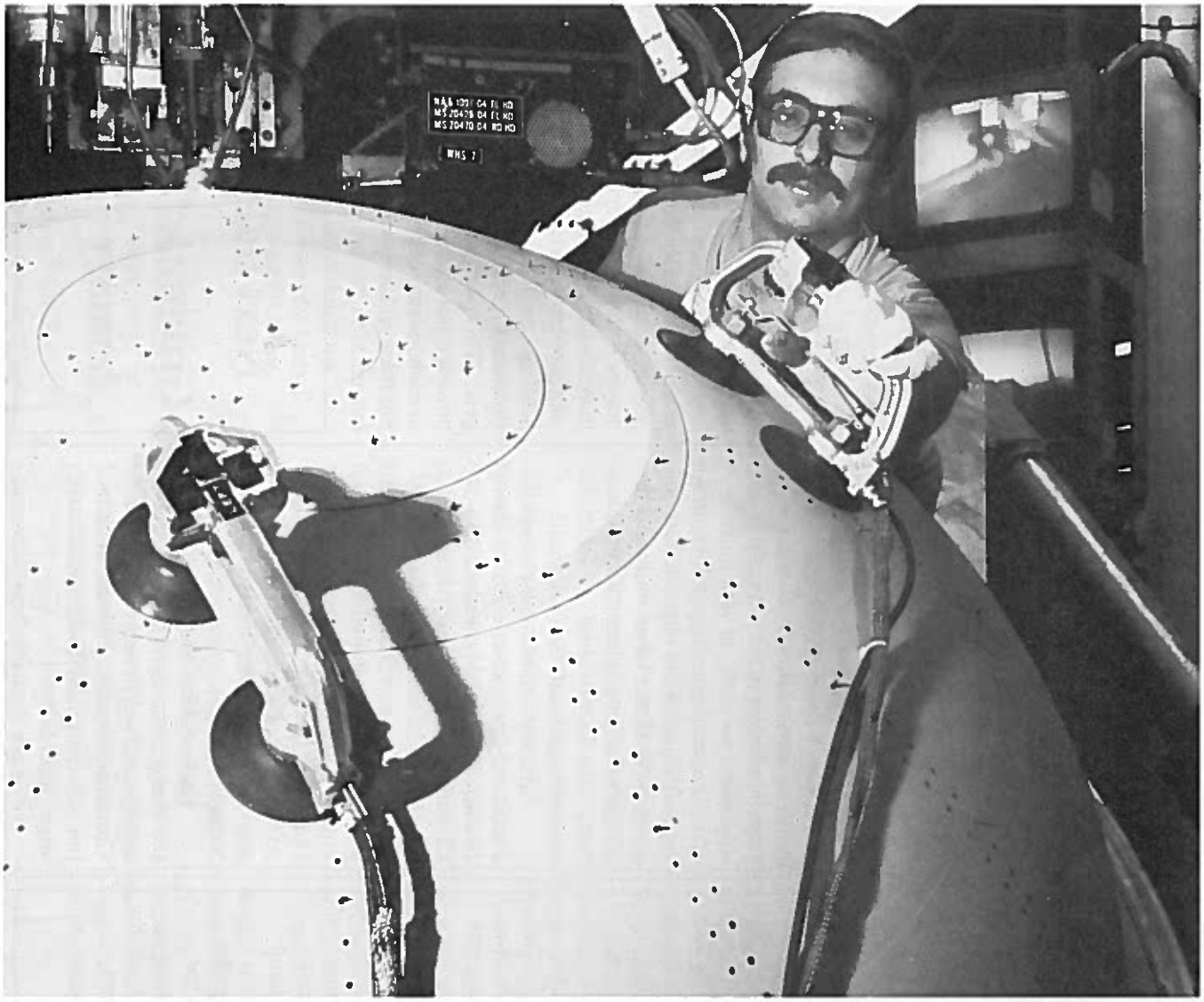
The Job Has Its Ups And Downs

Inventory operators Donald Zaleski (on fork-lift) and Doug Froehlich (with pad) handle some pretty tall orders over the course of their day in the Great River Operations warehouse.

Riding up and down six-foot-wide aisles on a fork-lift, the two Grummanites pick parts and make up order kits from shelves as high as 36 feet. "It's like traveling in an open-air elevator," says Zaleski. "Up and down, up and down, all day long."

In addition to picking parts for orders, Zaleski and Froehlich store new parts after they arrive and are tested in GRO's Shipping and Receiving department. The exact location of each part is stored in the warehouse's computer system.

More than 2,500 kinds of parts are stored on 14 steel and wire shelves stacked 36 feet high on each side of five aisles. The warehouse supplies everything from tiny electrical switches to giant spools of wire for Grumman programs and ships to plants all over the country.



Superdome. *In Plant 2 in Bethpage, assembler/riveter Domenick Corigliano operates a Drivmatic that rivets straps to the one-piece E-2C pressure dome. The Drivmatic's a handy tool. The computerized machine can drill, countersink, inject sealant, and insert and finish rivets. Using the Drivmatic, Corigliano can finish up to 21 rivets in the same amount of time it would take to finish one rivet manually. The dome will seal the aft of the Hawkeye's pressurized cabin.*

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